

A TECHNIQUE FOR CAPTURING PETRELS AND SHEARWATERS AT SEA *

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The hand-thrown net is an ancient tool which Gibson and Sefton (1959) used to capture albatrosses resting on water. We have adopted a similar throw-net technique to catch and band storm petrels and shearwaters in the Bay of Fundy near the Bowdoin Scientific Station at Kent Island, Grand Manan, New Brunswick, Canada (44°35'N, 66°45'W).

The major components of our nets are nylon netting and a frame of plastic hose (outside diameter 30 mm., walls 3 mm. thick) held in a circular shape by a dowel fitted tightly into the ends. A circular piece of mist-netting (36 mm. mesh), cut large enough to make a shallow, but slack, bag when threaded onto the frame, is most effective for storm petrels. For shearwaters, however, nylon gill-netting of 60 mm. mesh is as effective and much more durable than mist-netting. A hoop about 1.3 meters in diameter is best under normal conditions, but when birds can be lured to within a few meters of the boat, we can catch two or more at a throw with a hoop as large as 1.8 meters in diameter. We retrieve the hoop with a length of cod line.

During slack tide on calm, clear days tube-noses are easily attracted by a stream of chum squeezed from the livers of freshly caught fish. A thin trail of oil keeps Wilson's Petrels, *Oceanites oceanicus*, in a relatively compact group; however, if large pieces of bait are doled out, the petrels tend to be dispersed by the aggressiveness of Greater Shearwaters, *Puffinus gravis*. The latter are surprisingly bold, often approaching within a meter or two of the boat. The hoop is tossed from the fantail of the boat over a bird feeding nearby. They seem to come closer when the thrower is crouched and the hoop is held inconspicuously low. With practice even flying birds can be netted. Since petrels are frequently pinned to the water surface rather than actually entangled, they often roll out if the hoop is retrieved too quickly or escape when the hoop is lifted aboard. Such losses can be reduced by scooping the trapped birds up with a long-handled dip net. Because the plumage of petrels usually becomes wet during the process, we dried them out in draw-string cloth bags for one-half hour before release.

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To date we have banded 250 individuals of four species caught by our technique (Table 1). Fifty-seven Wilson's Petrels were caught on a single trip in early August 1965. Although thousands of Leach's Petrels, *Oceanodroma leucorhoa*, nest on islands in the Bay of Fundy, they are usually less common than Wilson's Petrels at sea in that area and are not easily attracted to boats. On one occasion, however, twelve Leach's Petrels and only two Wilson's Petrels were netted. At times Greater Shearwaters, whose noisy feeding attracts others of their kind, are especially easy to catch; on the afternoon of 18 August 1966 on the Northeast Grand Manan Bank (44°10'N, 67°00'W) we banded 72 within three hours. Sooty Shearwaters, *Puffinus griseus*, often accompany Greater Shearwaters in our area but are less common and bold. However, they and other species could probably be caught in large numbers where abundant.

Two of our Greater Shearwaters banded on the Northeast Grand Manan Bank have been recovered so far. One which we banded on 22 July 1965 was caught by hand on a French commercial trawler south of Ireland (50°20'N, 8°30'W) on 14 November 1967. The second was banded on 18 August 1966 and caught in fishing gear on the Grand Banks (46°50'N, 51°30'W) on 20 June 1968.

TABLE 1. SEABIRDS BANDED FROM 1965 THROUGH 1968.

<i>Species</i>	<i>Number</i>
Greater Shearwater	119
Sooty Shearwater	1
Wilson's Petrel	117
Leach's Petrel	13

We hope that the effectiveness of this method will encourage others to band birds at sea. The colonial habits of sea birds make it possible to band large numbers at the breeding grounds. Wilson's Petrels have been banded at their nests in the Antarctic by the British Graham Land Expedition (Roberts, 1940), the British Antarctic Survey (Sladen and Tickell, 1958; Hudson, 1963 and 1967), and the United States Antarctic Research Program (Sladen *et al.*, 1968), but in relatively small numbers. They would be easy to catch in large numbers by our throw-net technique in Antarctica, where they concentrate in sheltered harbors such as Deception Island (62°57'S, 60°38'W). Several thousand Leach's Petrels have been banded at Kent Island, New Brunswick (Gross, 1947), in Britain (Spencer, 1959), and elsewhere on their breeding grounds, as have Greater Shearwaters on Tristan da Cunha (Hagen, 1952; Hudson, 1967). If this work is supplemented by more banding at sea, we can hope to extend our meagre knowledge of the movements of these birds.

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AGE AND SEX DISTRIBUTION IN INDIGO BUNTINGS

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Fundamental to an understanding of population dynamics is the availability of reliable data on numbers in the various sex and age groups of the population. For passerine birds such quantitative data are notably scanty in the literature for several obvious reasons—the territorial nature and subsequent spacing of birds during the breeding season, difficulties in obtaining unbiased numbers at any season, problems in sex and age identification of live birds, difficulties in amassing large samples, and the like. Through recent years of intensive research it has been possible to obviate most of these sampling problems in the Indigo Bunting (*Passerina cyanea*), a species that has received attention from bird-banders, ecologists, physiologists, and students of animal behavior. The present account is an assessment of this species' sex and age structure with special emphasis upon numbers obtained during the nonbreeding months.